



Applications of Computer Vision in Motion Pictures and Aerial Surveillance

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Abstract

2d3 was established in 1999, alongside OMG's Vicon motion capture business, to deliver computer vision techniques into commercial markets. The first of these was the motion picture industry. The rapidly increasing use of computer graphics augmentation in movies and television required the use of a laborious process known as "match moving". Working frame-by-frame, a highly skilled operator would attempt to match the motion to the virtual CG camera, used to "render" the CG elements of the scene, to the motion of the real camera generating the pre-augmented, natural imagery. Using Structure from Motion, 2d3 developed *boujou*, the first automatic camera tracker. In the tutorial, using illustrated examples, I will explain the processing steps used by *boujou*.

Aerial imagery is used for a wide range of civilian and military purposes, from flood, fire, and agricultural management, traffic monitoring and search-and-rescue, and to provide enhanced military "situational awareness" and "image intelligence". A set of requirements is common to all these applications. The user wishes to maintain a live, "all-seeing" eye over an area of many tens or hundreds of square kilometres. Within this area, he wants to be able to spot and "geo-locate" objects as small as the disturbed soil of a buried "improvised explosive device". He also wants to be able to spot changes in imagery over time, collected with different cameras at different locations. During the tutorial, I will explain and demonstrate some of the techniques 2d3 is offering to meet these challenges.

Syllabus: Motion Pictures, Aerial Surveillance